

US EPA ARCHIVE DOCUMENT

## **Comparison of Methods for Nationwide Environmental Justice Analysis of Predicted SO<sub>2</sub> Levels**

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**Background and Objectives:** To explore the feasibility of environmental justice (EJ) assessment for a national regulation related to air quality, we implemented three different methods, ranging from simple to more complex.

**Methods:** A screening-level air quality model (SCREEN3) was applied to more than 15,000 facilities, to predict 1-hour maximum concentrations of SO<sub>2</sub> using default assumptions and sensitivity analysis. Approximately 2,000 key facilities with a potential for elevated ambient levels were identified. Three methods were compared for EJ analysis: (1) Co-location-based analysis—We analyzed demographics of census tracts containing the key facilities; (2) Proximity-based analysis—We analyzed demographics of persons within 1 km and 10 km of the key facilities; and (3) Ambient exposure-based analysis—We analyzed demographics of persons within zones predicted to exceed a selected ambient concentration. Facility locations were obtained from the U.S. Environmental Protection Agency's 2005 National Emissions Inventory and tract-level demographics from Census 2000. ArcGIS was used to locate relevant populations.

**Results:** Simple co-location analysis demonstrated that tracts containing the key facilities were similar to the United States overall with respect to percentage of households in poverty and percentage African American or black. However, these tracts were only 7 percentage Hispanic or Latino, well below the national average of 12.5 percent in 2000. Results for proximity-based analysis and exposure-based analysis will be presented and compared to the simpler analysis.

**Conclusions:** Screening-level analysis of EJ implications is feasible for a nationwide series of point sources with defined locations. However, nationwide EJ analysis may require the use of GIS software, even if simple co-location or proximity-based analysis is used.